



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5 CHICAGO REGIONAL LABORATORY  
536 SOUTH CLARK STREET  
CHICAGO, ILLINOIS 60605

**Date:** 6/3/2019

**Subject:** Review of Region 5 Data for Village Discount

**To:** Air Division, US EPA Region 5  
77 West Jackson Boulevard  
Chicago, IL 60605

**From:** Amanda Wroble, Chemist  
US EPA Region 5 Chicago Regional Laboratory

The data transmitted under this cover memo successfully passed CRL's data review procedures as documented in the current Quality Management Plan and applicable Standard Operating Procedures. In accordance with the EPA QA/G-8 *Guidance on Environmental Data Verification and Data Validation* and the U.S. EPA Region 5 RMD QMP, CRL performs data verification on all the data generated internally. CRL does not perform data validation or quality assessment procedures.

This report was reviewed and the information provided herein accurately represents the analysis performed.

A handwritten signature in black ink that reads "Amanda Wroble". The signature is written in a cursive, flowing style. Below the signature is a solid black horizontal line.

*Please contact the analyst with any technical report issues, Amanda Wroble at (312)-353-0375 for sample project concerns, and Sylvia Griffin at (312)-353-9073 with data transmittal questions. Thank you.*

**Attached are Results for: Village Discount**

**Analyses included in this report:**

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Metals ICP-MS (s)

Report Name: 1905008 Metals ICP-MS (s) FINAL Jun 03 19 1102



Environmental Protection Agency Region 5  
**Chicago Regional Laboratory**

536 South Clark Street, Chicago, IL 60605  
Phone:(312)353-8370 Fax:(312)886-2591

Air Division, US EPA Region 5  
77 West Jackson Boulevard  
Chicago IL, 60605

Project: Village Discount  
Project Number: 19SC01  
Project Manager: Sarah Clark

**Reported:**  
Jun-03-19 11:02

**Accredited Analyses included in this Report**



**Method:** EPA 200.8 in Soil  
**Analysis:** Metals ICP-MS (s)

Analyte	Certifications
Antimony	ISO/IEC 17025:2005
Arsenic	ISO/IEC 17025:2005
Barium	ISO/IEC 17025:2005
Beryllium	ISO/IEC 17025:2005
Cadmium	ISO/IEC 17025:2005
Chromium	ISO/IEC 17025:2005
Cobalt	ISO/IEC 17025:2005
Copper	ISO/IEC 17025:2005
Lead	ISO/IEC 17025:2005
Manganese	ISO/IEC 17025:2005
Molybdenum	ISO/IEC 17025:2005
Nickel	ISO/IEC 17025:2005
Selenium 78	ISO/IEC 17025:2005
Thallium	ISO/IEC 17025:2005
Thorium	ISO/IEC 17025:2005
Uranium	ISO/IEC 17025:2005
Vanadium	ISO/IEC 17025:2005
Zinc	ISO/IEC 17025:2005

Analytes not listed above are not accredited by ANAB.



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## ANALYSIS CASE NARRATIVE

### GENERAL INFORMATION

CRL received 17 solid samples for trace metals analysis by inductively coupled plasma-atomic emission spectroscopy (ICP-AES) and inductively coupled plasma-mass spectrometry (ICP-MS) on May 2, 2019. This report pertains to ICP-MS analysis of As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Th, Tl, U, V, and Zn. The assigned work order(s) and sample numbers to which this narrative applies are listed below:

Work Order (number of samples)	Batch Numbers
1905008 (17)	B19E029

The designated analyst for these samples, Amanda Wroble, can be reached at 312.353.0375. All holding times were met.

The samples were extracted using CRL SOP METALS025, Rev. 3 (EPA Method 200.2) and analyzed using CRL SOP METALS001, Rev. 9 (EPA Method 200.8/SW-846 Method 6020B).

### SAMPLE ANALYSIS AND RESULTS

The data reported herein meet the requirements referenced in the SOP used for analysis and any laboratory specifications stated in *Quality Assurance Project Plan for Road Surface Soil Sampling Investigation, Village Discount Outlet, Inc.*, dated April 2019, except multiple reporting limits. Due to several high level analytes, the results were reported from multiple dilutions and over two analytical runs.

Several analyte concentrations exceeded the highest calibration standard (500 µg/L); therefore, linearity was verified up to the concentrations in parentheses for manganese (10 mg/L), copper/zinc/lead (5 mg/L), and barium (2 mg/L) within the run from which the analytes were reported. Concentrations that exceeded the highest calibration for which linearity was not verified or concentrations that exceeded the linearity check were reported from dilutions. Analyte concentrations that were reported from dilutions include the following: 1905008-05 manganese, nickel, copper, arsenic, antimony, and lead; 1905008-07 zinc; 1905008-11/B19E029-DUP2/B19E029-MS4 zinc and lead; and 1905008-12 lead.

### QUALITY CONTROL



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All quality control audits that bracketed samples to which this narrative applies and the run in which a specific sample/analyte was reported were within CRL limits for the requested analytes or did not result in qualification of the data with the following exceptions.

Duplicate and Matrix Spike (DUP and MS): Relative Percent Difference (RPD) Limit  $\leq 20\%$ ; MS Recovery Limit =  $100 \pm 25\%$ . B19E029-DUP1 beryllium, nickel, and zinc results; B19E029-MS4 vanadium, chromium, and nickel results; B19E029-DUP2 beryllium, vanadium, chromium, manganese, nickel, copper, zinc, molybdenum, silver, cadmium, antimony, and barium results; and B19E029-MS4 vanadium, nickel, and silver results were outside their respective audit limits.

For analytes that failed both the duplicate and matrix spike audits, these results were flagged "J" in their respective source samples (1905008-01 for -DUP1/-MS2 and 1905008-11 for -DUP2/-MS4) due to inhomogeneity. 1905008-01 vanadium and chromium results failed the matrix spike audit but passed the duplicate audit; therefore, they were flagged "K" for potential high bias.

It is noted that additional analytes in B19E029-MS2 and B19E029-MS4 failed the matrix spike recovery audit. For the analytes contained in this ICP-MS report whose matrix spike recoveries were outside the audit limit but are not explicitly mentioned in this narrative, the corresponding spike concentrations were less than 30% of the native sample concentrations, in which case, the blank spike was used as the accuracy audit.

Calibration Verification (LCM): LCM Recovery Limit =  $100 \pm 10\%$ . Run 2 LCMs failed for nickel (86.1-87.9%). The nickel result for 1905008-05 was flagged "L" for potential low bias.



# Environmental Protection Agency Region 5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605  
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## WORK ORDER

Printed: 5/20/2019 8:36:15AM

1905008

## US EPA Region 5 Chicago Regional Laboratory

Client: Air Division, US EPA Region 5  
Project: Village Discount

Project Manager: Angela Ockrassa Davis  
Project Number: 19SC01

### Report To:

Sarah Clark  
Air Division, US EPA Region 5

77 West Jackson Boulevard  
Chicago, IL 60605

Phone: (312) 886-9733  
Fax: (312) 353-2001

Date Due: Jun-03-19 15:00 (32 day TAT)

Received By: Robert Snyder

Date Received: May-02-19 14:50

Logged In By: Robert Snyder

Date Logged In: May-07-19 12:21

Samples Received at: 0.5 °C  
Sample tags/labels Yes  
Seals Intact Yes  
Received on ice Yes  
Paperwork Included Yes

Work Order Comments:  
Note: S13-17 contain PII

Sample ID: [1905008-01](#) Sampled: [May-02-19 09:20](#) Matrix: [Soil](#)

Sample Name: [S01](#) Sample Location/Comments: [Village Discount # 1](#)

### Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 09:20	
Metals ICP-MS (s)	180	Oct-29-19 09:20	
Total % Dry Solids 105C	7	May-09-19 09:20	

Sample ID: [1905008-02](#) Sampled: [May-02-19 09:30](#) Matrix: [Soil](#)

Sample Name: [S02](#) Sample Location/Comments: [Village Discount # 2](#)

### Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 09:30	
Metals ICP-MS (s)	180	Oct-29-19 09:30	
Total % Dry Solids 105C	7	May-09-19 09:30	

Sample ID: [1905008-03](#) Sampled: [May-02-19 09:44](#) Matrix: [Soil](#)

Sample Name: [S03](#) Sample Location/Comments: [Village Discount # 3](#)

### Sample Comments:

Analysis	Hold time (days)	Expires	Comments
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1905008

## US EPA Region 5 Chicago Regional Laboratory

Client: Air Division, US EPA Region 5  
Project: Village Discount

Project Manager: Angela Ockrassa Davis  
Project Number: 19SC01

Sample ID: [1905008-03](#)      Sampled: [May-02-19 09:44](#)      Matrix: [Soil](#)

Sample Name: [S03](#)      Sample Location/Comments: [Village Discount # 3](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 09:44	
Metals ICP-MS (s)	180	Oct-29-19 09:44	
Total % Dry Solids 105C	7	May-09-19 09:44	

Sample ID: [1905008-04](#)      Sampled: [May-02-19 09:54](#)      Matrix: [Soil](#)

Sample Name: [S04](#)      Sample Location/Comments: [Village Discount # 4](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 09:54	
Metals ICP-MS (s)	180	Oct-29-19 09:54	
Total % Dry Solids 105C	7	May-09-19 09:54	

Sample ID: [1905008-05](#)      Sampled: [May-02-19 10:03](#)      Matrix: [Soil](#)

Sample Name: [S05](#)      Sample Location/Comments: [Village Discount # 5](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 10:03	
Metals ICP-MS (s)	180	Oct-29-19 10:03	
Total % Dry Solids 105C	7	May-09-19 10:03	

Sample ID: [1905008-06](#)      Sampled: [May-02-19 10:11](#)      Matrix: [Soil](#)

Sample Name: [S06](#)      Sample Location/Comments: [Village Discount # 6](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 10:11	
Metals ICP-MS (s)	180	Oct-29-19 10:11	
Total % Dry Solids 105C	7	May-09-19 10:11	

1905008

## US EPA Region 5 Chicago Regional Laboratory

Client: Air Division, US EPA Region 5  
Project: Village Discount

Project Manager: Angela Ockrassa Davis  
Project Number: 19SC01

Sample ID: [1905008-07](#)      Sampled: [May-02-19 10:21](#)      Matrix: [Soil](#)

Sample Name: [S07](#)      Sample Location/Comments: [Village Discount # 7](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 10:21	
Metals ICP-MS (s)	180	Oct-29-19 10:21	
Total % Dry Solids 105C	7	May-09-19 10:21	

Sample ID: [1905008-08](#)      Sampled: [May-02-19 10:29](#)      Matrix: [Soil](#)

Sample Name: [S08](#)      Sample Location/Comments: [Village Discount # 8](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 10:29	
Metals ICP-MS (s)	180	Oct-29-19 10:29	
Total % Dry Solids 105C	7	May-09-19 10:29	

Sample ID: [1905008-09](#)      Sampled: [May-02-19 10:38](#)      Matrix: [Soil](#)

Sample Name: [S09](#)      Sample Location/Comments: [Village Discount # 9](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 10:38	
Metals ICP-MS (s)	180	Oct-29-19 10:38	
Total % Dry Solids 105C	7	May-09-19 10:38	

Sample ID: [1905008-10](#)      Sampled: [May-02-19 10:51](#)      Matrix: [Soil](#)

Sample Name: [S10](#)      Sample Location/Comments: [Village Discount # 10](#)

## Sample Comments:

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 10:51	
Metals ICP-MS (s)	180	Oct-29-19 10:51	
Total % Dry Solids 105C	7	May-09-19 10:51	

**1905008****US EPA Region 5 Chicago Regional Laboratory****Client:** Air Division, US EPA Region 5  
**Project:** Village Discount**Project Manager:** Angela Ockrassa Davis  
**Project Number:** 19SC01**Sample ID:** [1905008-11](#) **Sampled:** [May-02-19 11:11](#) **Matrix:** [Soil](#)**Sample Name:** [S11](#)**Sample Location/Comments:** [Village Discount # 11](#)**Sample Comments:**

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 11:11	
Metals ICP-MS (s)	180	Oct-29-19 11:11	
Total % Dry Solids 105C	7	May-09-19 11:11	

**Sample ID:** [1905008-12](#) **Sampled:** [May-02-19 11:19](#) **Matrix:** [Soil](#)**Sample Name:** [S12](#)**Sample Location/Comments:** [Village Discount # 12](#)**Sample Comments:**

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 11:19	
Metals ICP-MS (s)	180	Oct-29-19 11:19	
Total % Dry Solids 105C	7	May-09-19 11:19	

**Sample ID:** [1905008-13](#) **Sampled:** [May-02-19 12:51](#) **Matrix:** [Soil](#)**Sample Name:** [S13](#)**Sample Location/Comments:** [Non responsive](#)**Sample Comments:** [PII](#)

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 12:51	
Metals ICP-MS (s)	180	Oct-29-19 12:51	
Total % Dry Solids 105C	7	May-09-19 12:51	

**Sample ID:** [1905008-14](#) **Sampled:** [May-02-19 13:01](#) **Matrix:** [Soil](#)**Sample Name:** [S14](#)**Sample Location/Comments:** [Non responsive](#)**Sample Comments:** [PII](#)

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 13:01	
Metals ICP-MS (s)	180	Oct-29-19 13:01	
Total % Dry Solids 105C	7	May-09-19 13:01	



**1905008****US EPA Region 5 Chicago Regional Laboratory****Client:** Air Division, US EPA Region 5  
**Project:** Village Discount**Project Manager:** Angela Ockrassa Davis  
**Project Number:** 19SC01**Sample ID:** [1905008-15](#)      **Sampled:** [May-02-19 13:09](#)      **Matrix:** [Soil](#)**Sample Name:** [S15](#)**Sample Location/Comments:** [Non responsive](#)**Sample Comments:** [PII](#)

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 13:09	
Metals ICP-MS (s)	180	Oct-29-19 13:09	
Total % Dry Solids 105C	7	May-09-19 13:09	

**Sample ID:** [1905008-16](#)      **Sampled:** [May-02-19 13:19](#)      **Matrix:** [Soil](#)**Sample Name:** [S16](#)**Sample Location/Comments:** [Non responsive](#)**Sample Comments:** [PII](#)

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 13:19	
Metals ICP-MS (s)	180	Oct-29-19 13:19	
Total % Dry Solids 105C	7	May-09-19 13:19	

**Sample ID:** [1905008-17](#)      **Sampled:** [May-02-19 13:31](#)      **Matrix:** [Soil](#)**Sample Name:** [S17](#)**Sample Location/Comments:** [Non responsive](#)**Sample Comments:** [PII](#)

Analysis	Hold time (days)	Expires	Comments
Metals full ICP (S)	180	Oct-29-19 13:31	
Metals ICP-MS (s)	180	Oct-29-19 13:31	
Total % Dry Solids 105C	7	May-09-19 13:31	

**1905008****US EPA Region 5 Chicago Regional Laboratory**

Client: Air Division, US EPA Region 5  
Project: Village Discount

Project Manager: Angela Ockrassa Davis  
Project Number: 19SC01

**REVIEWED***By Amanda Wroble at 8:37 am, May 20, 2019*

Reviewed By

Date



Environmental Protection Agency Region 5  
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Project: Village Discount  
Project Number: 19SC01  
Project Manager: Sarah Clark

**Reported:**  
Jun-03-19 11:02

**Metals by ICP-MS using EPA 6020 (modified)**  
**US EPA Region 5 Chicago Regional Laboratory**

**S01 (1905008-01) Matrix: Soil Sampled: May-02-19 09:20 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	6.8			0.59	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	4.1			1.2	"	"	"	"	"
Barium	33			5.9	"	"	"	"	"
Beryllium	0.68	J		0.59	"	"	"	"	"
Cadmium	U			0.59	"	"	"	"	"
Chromium	17	K		1.2	"	"	"	"	"
Cobalt	3.7			0.29	"	"	"	"	"
Copper	76			1.2	"	"	"	"	"
Lead	110			0.29	"	"	"	"	"
Manganese	690			0.59	"	"	"	"	"
Molybdenum	1.2			0.59	"	"	"	"	"
Nickel	27	J		0.59	"	"	"	"	"
Selenium 78	U			1.2	"	"	"	"	"
Thallium	U			0.29	"	"	"	"	"
Thorium	U			2.9	"	"	"	"	"
Uranium	0.40			0.29	"	"	"	"	"
Vanadium	12	K		5.9	"	"	"	"	"
Zinc	280	J		5.9	"	"	"	"	"

**S02 (1905008-02) Matrix: Soil Sampled: May-02-19 09:30 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	15			0.45	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	5.0			0.90	"	"	"	"	"
Barium	45			4.5	"	"	"	"	"
Beryllium	0.80			0.45	"	"	"	"	"
Cadmium	0.88			0.45	"	"	"	"	"
Chromium	36			0.90	"	"	"	"	"
Cobalt	2.2			0.22	"	"	"	"	"
Copper	110			0.90	"	"	"	"	"
Lead	270			0.22	"	"	"	"	"
Manganese	920			0.45	"	"	"	"	"
Molybdenum	1.5			0.45	"	"	"	"	"
Nickel	16			0.45	"	"	"	"	"
Selenium 78	U			0.90	"	"	"	"	"
Thallium	U			0.22	"	"	"	"	"



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Project: Village Discount  
Project Number: 19SC01  
Project Manager: Sarah Clark

**Reported:**  
Jun-03-19 11:02

**Metals by ICP-MS using EPA 6020 (modified)**  
**US EPA Region 5 Chicago Regional Laboratory**

**S02 (1905008-02) Matrix: Soil Sampled: May-02-19 09:30 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Thorium	U			2.2	mg/kg	5	B19E029	May-21-19	May-28-19
Uranium	0.48			0.22	"	"	"	"	"
Vanadium	16			4.5	"	"	"	"	"
Zinc	320			4.5	"	"	"	"	"

**S03 (1905008-03) Matrix: Soil Sampled: May-02-19 09:44 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	29			0.46	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	16			0.93	"	"	"	"	"
Barium	150			4.6	"	"	"	"	"
Beryllium	1.3			0.46	"	"	"	"	"
Cadmium	3.5			0.46	"	"	"	"	"
Chromium	140			0.93	"	"	"	"	"
Cobalt	4.2			0.23	"	"	"	"	"
Copper	760			0.93	"	"	"	"	"
Lead	780			0.23	"	"	"	"	"
Manganese	4500			0.46	"	"	"	"	"
Molybdenum	3.7			0.46	"	"	"	"	"
Nickel	60			0.46	"	"	"	"	"
Selenium 78	0.95			0.93	"	"	"	"	"
Thallium	U			0.23	"	"	"	"	"
Thorium	U			2.3	"	"	"	"	"
Uranium	0.99			0.23	"	"	"	"	"
Vanadium	77			4.6	"	"	"	"	"
Zinc	1200			4.6	"	"	"	"	"



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Chicago IL, 60605

Project: Village Discount  
Project Number: 19SC01  
Project Manager: Sarah Clark

**Reported:**  
Jun-03-19 11:02

**Metals by ICP-MS using EPA 6020 (modified)**  
**US EPA Region 5 Chicago Regional Laboratory**

**S04 (1905008-04)**

**Matrix: Soil**

**Sampled: May-02-19 09:54**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	9.0			0.55	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	5.0			1.1	"	"	"	"	"
Barium	100			5.5	"	"	"	"	"
Beryllium	1.1			0.55	"	"	"	"	"
Cadmium	1.1			0.55	"	"	"	"	"
Chromium	74			1.1	"	"	"	"	"
Cobalt	3.1			0.27	"	"	"	"	"
Copper	150			1.1	"	"	"	"	"
Lead	200			0.27	"	"	"	"	"
Manganese	3200			0.55	"	"	"	"	"
Molybdenum	2.3			0.55	"	"	"	"	"
Nickel	16			0.55	"	"	"	"	"
Selenium 78	U			1.1	"	"	"	"	"
Thallium	U			0.27	"	"	"	"	"
Thorium	U			2.7	"	"	"	"	"
Uranium	1.1			0.27	"	"	"	"	"
Vanadium	52			5.5	"	"	"	"	"
Zinc	380			5.5	"	"	"	"	"

**S05 (1905008-05)**

**Matrix: Soil**

**Sampled: May-02-19 10:03**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	380			59	mg/kg	500	B19E029	May-21-19	May-29-19
Arsenic	U			120	"	"	"	"	"
Barium	140			5.9	"	5	"	"	May-28-19
Beryllium	1.3			0.59	"	"	"	"	"
Cadmium	2.6			0.59	"	"	"	"	"
Chromium	170			1.2	"	"	"	"	"
Cobalt	10			0.29	"	"	"	"	"
Copper	82000			1200	"	5000	"	"	May-29-19
Lead	4400			29	"	500	"	"	May-29-19
Manganese	7300			59	"	"	"	"	"
Molybdenum	12			0.59	"	5	"	"	May-28-19
Nickel	1600	L		59	"	500	"	"	May-29-19
Selenium 78	5.1			1.2	"	5	"	"	May-28-19
Thallium	U			0.29	"	"	"	"	"
Thorium	U			2.9	"	"	"	"	"



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**Reported:**  
Jun-03-19 11:02

**Metals by ICP-MS using EPA 6020 (modified)**  
**US EPA Region 5 Chicago Regional Laboratory**

**S05 (1905008-05) Matrix: Soil Sampled: May-02-19 10:03 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Uranium	1.0			0.29	mg/kg	5	B19E029	May-21-19	May-28-19
Vanadium	140			5.9	"	"	"	"	"
Zinc	2900			5.9	"	"	"	"	"

**S06 (1905008-06) Matrix: Soil Sampled: May-02-19 10:11 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	17			0.53	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	4.1			1.1	"	"	"	"	"
Barium	150			5.3	"	"	"	"	"
Beryllium	2.9			0.53	"	"	"	"	"
Cadmium	5.1			0.53	"	"	"	"	"
Chromium	97			1.1	"	"	"	"	"
Cobalt	2.6			0.27	"	"	"	"	"
Copper	380			1.1	"	"	"	"	"
Lead	1100			0.27	"	"	"	"	"
Manganese	3900			0.53	"	"	"	"	"
Molybdenum	1.9			0.53	"	"	"	"	"
Nickel	16			0.53	"	"	"	"	"
Selenium 78	1.4			1.1	"	"	"	"	"
Thallium	U			0.27	"	"	"	"	"
Thorium	U			2.7	"	"	"	"	"
Uranium	1.1			0.27	"	"	"	"	"
Vanadium	65			5.3	"	"	"	"	"
Zinc	1300			5.3	"	"	"	"	"

**S07 (1905008-07) Matrix: Soil Sampled: May-02-19 10:21 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	16			0.44	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	5.8			0.89	"	"	"	"	"
Barium	130			4.4	"	"	"	"	"
Beryllium	2.3			0.44	"	"	"	"	"
Cadmium	2.8			0.44	"	"	"	"	"
Chromium	82			0.89	"	"	"	"	"
Cobalt	4.1			0.22	"	"	"	"	"
Copper	480			0.89	"	"	"	"	"



Environmental Protection Agency Region 5  
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Project: Village Discount  
Project Number: 19SC01  
Project Manager: Sarah Clark

**Reported:**  
Jun-03-19 11:02

**Metals by ICP-MS using EPA 6020 (modified)**  
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**S07 (1905008-07)**

**Matrix: Soil**

**Sampled: May-02-19 10:21**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	700			0.22	mg/kg	5	B19E029	May-21-19	May-28-19
Manganese	2800			0.44	"	"	"	"	"
Molybdenum	3.1			0.44	"	"	"	"	"
Nickel	25			0.44	"	"	"	"	"
Selenium 78	1.2			0.89	"	"	"	"	"
Thallium	U			0.22	"	"	"	"	"
Thorium	U			2.2	"	"	"	"	"
Uranium	1.1			0.22	"	"	"	"	"
Vanadium	47			4.4	"	"	"	"	"
Zinc	2600			440	"	500	"	"	May-29-19

**S08 (1905008-08)**

**Matrix: Soil**

**Sampled: May-02-19 10:29**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	7.1			0.55	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	3.2			1.1	"	"	"	"	"
Barium	100			5.5	"	"	"	"	"
Beryllium	2.4			0.55	"	"	"	"	"
Cadmium	2.4			0.55	"	"	"	"	"
Chromium	61			1.1	"	"	"	"	"
Cobalt	2.3			0.27	"	"	"	"	"
Copper	190			1.1	"	"	"	"	"
Lead	310			0.27	"	"	"	"	"
Manganese	2700			0.55	"	"	"	"	"
Molybdenum	2.0			0.55	"	"	"	"	"
Nickel	12			0.55	"	"	"	"	"
Selenium 78	1.2			1.1	"	"	"	"	"
Thallium	U			0.27	"	"	"	"	"
Thorium	U			2.7	"	"	"	"	"
Uranium	1.0			0.27	"	"	"	"	"
Vanadium	41			5.5	"	"	"	"	"
Zinc	620			5.5	"	"	"	"	"



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**Metals by ICP-MS using EPA 6020 (modified)**  
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**S09 (1905008-09)**

**Matrix: Soil**

**Sampled: May-02-19 10:38**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	11			0.48	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	5.2			0.97	"	"	"	"	"
Barium	270			4.8	"	"	"	"	"
Beryllium	2.3			0.48	"	"	"	"	"
Cadmium	2.7			0.48	"	"	"	"	"
Chromium	34			0.97	"	"	"	"	"
Cobalt	3.3			0.24	"	"	"	"	"
Copper	250			0.97	"	"	"	"	"
Lead	520			0.24	"	"	"	"	"
Manganese	1500			0.48	"	"	"	"	"
Molybdenum	2.1			0.48	"	"	"	"	"
Nickel	26			0.48	"	"	"	"	"
Selenium 78	1.2			0.97	"	"	"	"	"
Thallium	U			0.24	"	"	"	"	"
Thorium	U			2.4	"	"	"	"	"
Uranium	1.1			0.24	"	"	"	"	"
Vanadium	25			4.8	"	"	"	"	"
Zinc	1200			4.8	"	"	"	"	"

**S10 (1905008-10)**

**Matrix: Soil**

**Sampled: May-02-19 10:51**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	29			0.46	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	5.3			0.92	"	"	"	"	"
Barium	110			4.6	"	"	"	"	"
Beryllium	1.7			0.46	"	"	"	"	"
Cadmium	2.0			0.46	"	"	"	"	"
Chromium	35			0.92	"	"	"	"	"
Cobalt	3.1			0.23	"	"	"	"	"
Copper	310			0.92	"	"	"	"	"
Lead	810			0.23	"	"	"	"	"
Manganese	1600			0.46	"	"	"	"	"
Molybdenum	1.4			0.46	"	"	"	"	"
Nickel	18			0.46	"	"	"	"	"
Selenium 78	1.0			0.92	"	"	"	"	"
Thallium	U			0.23	"	"	"	"	"
Thorium	U			2.3	"	"	"	"	"





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**S10 (1905008-10) Matrix: Soil Sampled: May-02-19 10:51 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Uranium	0.89			0.23	mg/kg	5	B19E029	May-21-19	May-28-19
Vanadium	24			4.6	"	"	"	"	"
Zinc	2100			4.6	"	"	"	"	"

**S11 (1905008-11) Matrix: Soil Sampled: May-02-19 11:11 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	38	J		0.53	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	6.9			1.1	"	"	"	"	"
Barium	120	J		5.3	"	"	"	"	"
Beryllium	1.3	J		0.53	"	"	"	"	"
Cadmium	2.7	J		0.53	"	"	"	"	"
Chromium	66	J		1.1	"	"	"	"	"
Cobalt	3.8			0.26	"	"	"	"	"
Copper	350	J		1.1	"	"	"	"	"
Lead	2700			26	"	500	"	"	May-29-19
Manganese	1700	J		0.53	"	5	"	"	May-28-19
Molybdenum	5.1	J		0.53	"	"	"	"	"
Nickel	20	J		0.53	"	"	"	"	"
Selenium 78	U			1.1	"	"	"	"	"
Thallium	U			0.26	"	"	"	"	"
Thorium	U			2.6	"	"	"	"	"
Uranium	0.80			0.26	"	"	"	"	"
Vanadium	25	J		5.3	"	"	"	"	"
Zinc	2200	J		530	"	500	"	"	May-29-19

**S12 (1905008-12) Matrix: Soil Sampled: May-02-19 11:19 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	35			0.51	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	10			1.0	"	"	"	"	"
Barium	100			5.1	"	"	"	"	"
Beryllium	1.9			0.51	"	"	"	"	"
Cadmium	7.9			0.51	"	"	"	"	"
Chromium	43			1.0	"	"	"	"	"
Cobalt	2.5			0.26	"	"	"	"	"
Copper	370			1.0	"	"	"	"	"



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**S12 (1905008-12)**

**Matrix: Soil**

**Sampled: May-02-19 11:19**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Lead	3400			26	mg/kg	500	B19E029	May-21-19	May-29-19
Manganese	1600			0.51	"	5	"	"	May-28-19
Molybdenum	2.6			0.51	"	"	"	"	"
Nickel	21			0.51	"	"	"	"	"
Selenium 78	1.2			1.0	"	"	"	"	"
Thallium	U			0.26	"	"	"	"	"
Thorium	U			2.6	"	"	"	"	"
Uranium	1.0			0.26	"	"	"	"	"
Vanadium	26			5.1	"	"	"	"	"
Zinc	1500			5.1	"	"	"	"	"

**S13 (1905008-13)**

**Matrix: Soil**

**Sampled: May-02-19 12:51**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	0.59			0.56	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	8.3			1.1	"	"	"	"	"
Barium	88			5.6	"	"	"	"	"
Beryllium	0.81			0.56	"	"	"	"	"
Cadmium	U			0.56	"	"	"	"	"
Chromium	22			1.1	"	"	"	"	"
Cobalt	10			0.28	"	"	"	"	"
Copper	19			1.1	"	"	"	"	"
Lead	35			0.28	"	"	"	"	"
Manganese	630			0.56	"	"	"	"	"
Molybdenum	1.6			0.56	"	"	"	"	"
Nickel	19			0.56	"	"	"	"	"
Selenium 78	1.4			1.1	"	"	"	"	"
Thallium	U			0.28	"	"	"	"	"
Thorium	U			2.8	"	"	"	"	"
Uranium	1.2			0.28	"	"	"	"	"
Vanadium	24			5.6	"	"	"	"	"
Zinc	83			5.6	"	"	"	"	"



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**S14 (1905008-14)**

**Matrix: Soil**

**Sampled: May-02-19 13:01**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	0.90			0.56	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	8.0			1.1	"	"	"	"	"
Barium	83			5.6	"	"	"	"	"
Beryllium	0.81			0.56	"	"	"	"	"
Cadmium	0.62			0.56	"	"	"	"	"
Chromium	23			1.1	"	"	"	"	"
Cobalt	7.7			0.28	"	"	"	"	"
Copper	58			1.1	"	"	"	"	"
Lead	71			0.28	"	"	"	"	"
Manganese	570			0.56	"	"	"	"	"
Molybdenum	2.4			0.56	"	"	"	"	"
Nickel	19			0.56	"	"	"	"	"
Selenium 78	1.4			1.1	"	"	"	"	"
Thallium	U			0.28	"	"	"	"	"
Thorium	U			2.8	"	"	"	"	"
Uranium	1.4			0.28	"	"	"	"	"
Vanadium	25			5.6	"	"	"	"	"
Zinc	130			5.6	"	"	"	"	"

**S15 (1905008-15)**

**Matrix: Soil**

**Sampled: May-02-19 13:09**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	2.9			0.56	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	11			1.1	"	"	"	"	"
Barium	160			5.6	"	"	"	"	"
Beryllium	0.92			0.56	"	"	"	"	"
Cadmium	3.4			0.56	"	"	"	"	"
Chromium	98			1.1	"	"	"	"	"
Cobalt	4.4			0.28	"	"	"	"	"
Copper	60			1.1	"	"	"	"	"
Lead	490			0.28	"	"	"	"	"
Manganese	1100			0.56	"	"	"	"	"
Molybdenum	4.0			0.56	"	"	"	"	"
Nickel	26			0.56	"	"	"	"	"
Selenium 78	1.9			1.1	"	"	"	"	"
Thallium	U			0.28	"	"	"	"	"
Thorium	U			2.8	"	"	"	"	"



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**US EPA Region 5 Chicago Regional Laboratory**

**S15 (1905008-15) Matrix: Soil Sampled: May-02-19 13:09 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Uranium	2.1			0.28	mg/kg	5	B19E029	May-21-19	May-28-19
Vanadium	39			5.6	"	"	"	"	"
Zinc	530			5.6	"	"	"	"	"

**S16 (1905008-16) Matrix: Soil Sampled: May-02-19 13:19 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	0.69			0.54	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	5.3			1.1	"	"	"	"	"
Barium	78			5.4	"	"	"	"	"
Beryllium	1.3			0.54	"	"	"	"	"
Cadmium	0.58			0.54	"	"	"	"	"
Chromium	18			1.1	"	"	"	"	"
Cobalt	5.4			0.27	"	"	"	"	"
Copper	18			1.1	"	"	"	"	"
Lead	54			0.27	"	"	"	"	"
Manganese	740			0.54	"	"	"	"	"
Molybdenum	1.5			0.54	"	"	"	"	"
Nickel	11			0.54	"	"	"	"	"
Selenium 78	1.3			1.1	"	"	"	"	"
Thallium	U			0.27	"	"	"	"	"
Thorium	U			2.7	"	"	"	"	"
Uranium	0.69			0.27	"	"	"	"	"
Vanadium	20			5.4	"	"	"	"	"
Zinc	100			5.4	"	"	"	"	"

**S17 (1905008-17) Matrix: Soil Sampled: May-02-19 13:31 Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Antimony	0.66			0.50	mg/kg	5	B19E029	May-21-19	May-28-19
Arsenic	6.3			1.0	"	"	"	"	"
Barium	120			5.0	"	"	"	"	"
Beryllium	1.7			0.50	"	"	"	"	"
Cadmium	0.61			0.50	"	"	"	"	"
Chromium	16			1.0	"	"	"	"	"
Cobalt	4.1			0.25	"	"	"	"	"
Copper	18			1.0	"	"	"	"	"



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**Metals by ICP-MS using EPA 6020 (modified)**  
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**S17 (1905008-17)**

**Matrix: Soil**

**Sampled: May-02-19 13:31**

**Received: May-02-19 14:50**

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
<b>Lead</b>	<b>96</b>			0.25	mg/kg	5	B19E029	May-21-19	May-28-19
<b>Manganese</b>	<b>940</b>			0.50	"	"	"	"	"
<b>Molybdenum</b>	<b>1.5</b>			0.50	"	"	"	"	"
<b>Nickel</b>	<b>13</b>			0.50	"	"	"	"	"
<b>Selenium 78</b>	<b>1.9</b>			1.0	"	"	"	"	"
<b>Thallium</b>	<b>U</b>			0.25	"	"	"	"	"
<b>Thorium</b>	<b>U</b>			2.5	"	"	"	"	"
<b>Uranium</b>	<b>1.5</b>			0.25	"	"	"	"	"
<b>Vanadium</b>	<b>20</b>			5.0	"	"	"	"	"
<b>Zinc</b>	<b>140</b>			5.0	"	"	"	"	"



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**Metals by ICP-MS using EPA 6020 (modified) - Quality Control**  
**US EPA Region 5 Chicago Regional Laboratory**

**Batch B19E029 - Hot Block Digestion**

Blank (B19E029-BLK1)

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	U			0.50	mg/kg						
Arsenic	U			1.0	"						
Barium	U			5.0	"						
Beryllium	U			0.50	"						
Cadmium	U			0.50	"						
Chromium	U			1.0	"						
Cobalt	U			0.25	"						
Copper	U			1.0	"						
Lead	U			0.25	"						
Manganese	U			0.50	"						
Molybdenum	U			0.50	"						
Nickel	U			0.50	"						
Selenium 78	U			1.0	"						
Thallium	U			0.25	"						
Thorium	U			2.5	"						
Uranium	U			0.25	"						
Vanadium	U			5.0	"						
Zinc	U			5.0	"						

LCS (B19E029-BS2)

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	10.1			0.50	mg/kg	10.00		101%	85-115		
Arsenic	9.95			1.0	"	10.00		99.5%	85-115		
Barium	9.46			5.0	"	10.00		94.6%	85-115		
Beryllium	10.4			0.50	"	10.00		104%	85-115		
Cadmium	9.53			0.50	"	10.00		95.3%	85-115		
Chromium	10.1			1.0	"	10.00		101%	85-115		
Cobalt	10.1			0.25	"	10.00		101%	85-115		
Copper	9.89			1.0	"	10.00		98.9%	85-115		
Lead	10.2			0.25	"	10.00		102%	85-115		
Manganese	9.75			0.50	"	10.00		97.5%	85-115		



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Project: Village Discount  
Project Number: 19SC01  
Project Manager: Sarah Clark

**Reported:**  
Jun-03-19 11:02

**Metals by ICP-MS using EPA 6020 (modified) - Quality Control**  
**US EPA Region 5 Chicago Regional Laboratory**

**Batch B19E029 - Hot Block Digestion**

LCS (B19E029-BS2)

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Molybdenum	9.86			0.50	mg/kg	10.00		98.6%	85-115		
Nickel	9.95			0.50	"	10.00		99.5%	85-115		
Selenium 78	9.86			1.0	"	10.00		98.6%	85-115		
Thallium	10.2			0.25	"	10.00		102%	85-115		
Thorium	10.2			2.5	"	10.00		102%	85-115		
Uranium	10.2			0.25	"	10.00		102%	85-115		
Vanadium	9.91			5.0	"	10.00		99.1%	85-115		
Zinc	10.1			5.0	"	10.00		101%	85-115		

Duplicate (B19E029-DUP1)

Source: 1905008-01

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	6.29			0.50	mg/kg		6.82			8.11	20
Arsenic	4.59			1.0	"		4.07			12.0	20
Barium	29.1			5.0	"		33.1			12.9	20
Beryllium	0.54	Q		0.50	"		0.68			22.9	20
Cadmium	0.50			0.50	"		0.45			10.5	20
Chromium	15.4			1.0	"		17.1			10.4	20
Cobalt	4.35			0.25	"		3.74			15.2	20
Copper	78.2			1.0	"		76.3			2.45	20
Lead	103			0.25	"		107			3.56	20
Manganese	564			0.50	"		685			19.4	20
Molybdenum	1.14			0.50	"		1.22			7.07	20
Nickel	12.4	Q		0.50	"		27.0			74.2	20
Selenium 78	0.61			1.0	"		0.58			4.75	20
Thallium	0.12	Q		0.25	"		0.06			69.8	20
Thorium	0.80			2.5	"		0.93			15.9	20
Uranium	0.35			0.25	"		0.40			12.5	20
Vanadium	9.92			5.0	"		11.7			16.1	20
Zinc	189	Q		5.0	"		284			40.0	20



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**Reported:**  
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**Metals by ICP-MS using EPA 6020 (modified) - Quality Control**  
**US EPA Region 5 Chicago Regional Laboratory**

**Batch B19E029 - Hot Block Digestion**

Duplicate (B19E029-DUP2)		Source: 1905008-11		Prepared: May-21-19 Analyzed: May-28-19							
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	25.8	Q		0.49	mg/kg		38.2			38.7	20
Arsenic	8.14			0.98	"		6.89			16.7	20
Barium	153	Q		4.9	"		124			20.7	20
Beryllium	2.48	Q		0.49	"		1.30			62.5	20
Cadmium	3.75	Q		0.49	"		2.71			32.0	20
Chromium	118	Q		0.98	"		66.5			56.0	20
Cobalt	4.26			0.24	"		3.77			12.3	20
Copper	590	Q		0.98	"		347			51.9	20
Lead	2340			24	"		2690			13.9	20
Manganese	3650	Q		0.49	"		1700			73.1	20
Molybdenum	2.63	Q		0.49	"		5.06			63.3	20
Nickel	25.0	Q		0.49	"		20.2			21.1	20
Selenium 78	1.12			0.98	"		0.97			14.5	20
Thallium	0.08	Q		0.24	"		0.06			42.1	20
Thorium	1.68	Q		2.4	"		1.37			20.7	20
Uranium	0.87			0.24	"		0.80			8.57	20
Vanadium	54.9	Q		4.9	"		25.0			74.8	20
Zinc	4270	Q		490	"		2240			62.3	20

**MRL Check (B19E029-MRL2)**

		Prepared: May-21-19 Analyzed: May-28-19									
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	0.50			0.50	mg/kg	0.5000		100%	65-135		
Arsenic	1.01			1.0	"	1.000		101%	65-135		
Barium	4.66			5.0	"	5.000		93.3%	65-135		
Beryllium	0.51			0.50	"	0.5000		101%	65-135		
Cadmium	0.48			0.50	"	0.5000		95.5%	65-135		
Chromium	1.09			1.0	"	1.000		109%	65-135		
Cobalt	0.25			0.25	"	0.2500		100%	65-135		
Copper	1.01			1.0	"	1.000		101%	65-135		
Lead	0.25			0.25	"	0.2500		101%	65-135		
Manganese	0.42			0.50	"	0.5000		84.1%	65-135		
Molybdenum	0.49			0.50	"	0.5000		98.1%	65-135		





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**Metals by ICP-MS using EPA 6020 (modified) - Quality Control**  
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**Batch B19E029 - Hot Block Digestion**

MRL Check (B19E029-MRL2)

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nickel	0.50			0.50	mg/kg	0.5000		100%	65-135		
Selenium 78	1.02			1.0	"	1.000		102%	65-135		
Thallium	0.25			0.25	"	0.2500		101%	65-135		
Thorium	2.58			2.5	"	2.500		103%	65-135		
Uranium	0.25			0.25	"	0.2500		98.0%	65-135		
Vanadium	4.82			5.0	"	5.000		96.5%	65-135		
Zinc	5.20			5.0	"	5.000		104%	65-135		

Matrix Spike (B19E029-MS2)

Source: 1905008-01

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	15.2			0.50	mg/kg	10.00	6.82	83.7%	75-125		
Arsenic	15.1			1.0	"	10.00	4.07	110%	75-125		
Barium	45.4			5.0	"	10.00	33.1	122%	75-125		
Beryllium	10.9			0.50	"	10.00	0.68	102%	75-125		
Cadmium	11.3			0.50	"	10.00	0.45	108%	75-125		
Chromium	69.5	Q		1.0	"	10.00	17.1	524%	75-125		
Cobalt	13.2			0.25	"	10.00	3.74	94.3%	75-125		
Copper	89.1	Q		1.0	"	10.00	76.3	128%	75-125		
Lead	126	Q		0.25	"	10.00	107	192%	75-125		
Manganese	1680	Q		0.50	"	10.00	685	NR	75-125		
Molybdenum	11.9			0.50	"	10.00	1.22	106%	75-125		
Nickel	19.9	Q		0.50	"	10.00	27.0	NR	75-125		
Selenium 78	10.2			1.0	"	10.00	0.58	95.8%	75-125		
Thallium	10.4			0.25	"	10.00	0.06	104%	75-125		
Thorium	11.8			2.5	"	10.00	0.93	108%	75-125		
Uranium	11.2			0.25	"	10.00	0.40	108%	75-125		
Vanadium	37.1	Q		5.0	"	10.00	11.7	255%	75-125		
Zinc	211	Q		5.0	"	10.00	284	NR	75-125		



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Reported:  
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**Metals by ICP-MS using EPA 6020 (modified) - Quality Control**  
**US EPA Region 5 Chicago Regional Laboratory**

**Batch B19E029 - Hot Block Digestion**

Matrix Spike (B19E029-MS4)		Source: 1905008-11		Prepared: May-21-19 Analyzed: May-28-19							
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	21.2	Q		0.45	mg/kg	8.927	38.2	NR	75-125		
Arsenic	13.8			0.89	"	8.927	6.89	77.7%	75-125		
Barium	161	Q		4.5	"	8.927	124	417%	75-125		
Beryllium	9.82			0.45	"	8.927	1.30	95.5%	75-125		
Cadmium	10.6			0.45	"	8.927	2.71	88.4%	75-125		
Chromium	74.6			0.89	"	8.927	66.5	91.0%	75-125		
Cobalt	11.5			0.22	"	8.927	3.77	86.7%	75-125		
Copper	770	Q		0.89	"	8.927	347	NR	75-125		
Lead	2840	Q		22	"	8.927	2690	NR	75-125		
Manganese	2900	Q		0.45	"	8.927	1700	NR	75-125		
Molybdenum	12.3			0.45	"	8.927	5.06	81.1%	75-125		
Nickel	42.9	Q		0.45	"	8.927	20.2	255%	75-125		
Selenium 78	7.99			0.89	"	8.927	0.97	78.7%	75-125		
Thallium	7.15			0.22	"	8.927	0.06	79.5%	75-125		
Thorium	9.97			2.2	"	8.927	1.37	96.4%	75-125		
Uranium	8.51			0.22	"	8.927	0.80	86.4%	75-125		
Vanadium	53.6	Q		4.5	"	8.927	25.0	321%	75-125		
Zinc	5300	Q		450	"	8.927	2240	NR	75-125		

Reference (B19E029-SRM2)		Prepared: May-21-19 Analyzed: May-28-19									
Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	126			6.2	mg/kg	146.0		86.0%	0-94.5		
Arsenic	144			12	"	157.0		91.6%	77.7-110		
Barium	295			62	"	339.0		87.1%	76.1-109		
Beryllium	56.1			6.2	"	58.30		96.2%	75.8-107		
Cadmium	185			6.2	"	216.0		85.7%	73.6-105		
Chromium	80.0			12	"	88.90		90.0%	76-110		
Cobalt	83.0			3.1	"	87.30		95.1%	77.7-109		
Copper	163			12	"	184.0		88.7%	77.7-108		
Lead	91.2			3.1	"	94.30		96.7%	81-115		
Manganese	225			6.2	"	232.0		97.0%	78.4-113		
Molybdenum	152			6.2	"	167.0		91.2%	69.5-105		



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**US EPA Region 5 Chicago Regional Laboratory**

**Batch B19E029 - Hot Block Digestion**

Reference (B19E029-SRM2)

Prepared: May-21-19 Analyzed: May-28-19

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nickel	140			6.2	mg/kg	154.0		90.9%	73.4-105		
Thallium	156			3.1	"	167.0		93.4%	74.3-109		
Uranium	93.0			3.1	"	100.0		93.0%	65.2-113		
Vanadium	88.9			62	"	100.0		88.9%	67.2-106		
Zinc	183			62	"	209.0		87.4%	62.7-109		



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**Notes and Definitions**

- L The identification of the analyte is acceptable; the reported value may be biased low. The actual value is expected to be greater than the reported value.
- K The identification of the analyte is acceptable; the reported value may be biased high. The actual value is expected to be less than the reported value.
- J The identification of the analyte is acceptable; the reported value is an estimate.
- U Not Detected
- NR Not Reported
- Q QC limit Exceeded